

Product Summary

Device	V _{(BR)DSS}	R _{DS(ON)} Max	I _D Max T _C = +25°C (Note 10)
Q1 & Q2	30V	11.1mΩ @ V _{GS} = 10V	30A
		13.8mΩ @ V _{GS} = 4.5V	28A
		22.0mΩ @ V _{GS} = 3.8V	22A

Description

This new generation MOSFET is designed to minimize the on-state resistance (R_{DS(ON)}), yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

Applications

- General Purpose Interfacing Switch
- Power Management Functions

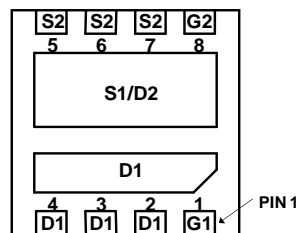
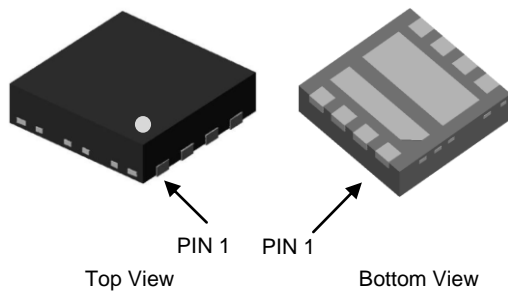
Features and Benefits

- Low Gate Threshold Voltage
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

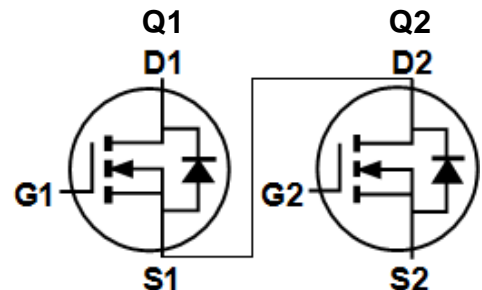
Mechanical Data

- Case: V-DFN3030-8
- Case Material: Molded Plastic, "Green" Molding Compound.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – NiPdAu over Copper Leadframe.
Solderable per MIL-STD-202, Method 208 @4
- Weight: 0.02 grams (Approximate)

V-DFN3030-8



Bottom View
Internal Schematic



Equivalent Circuit

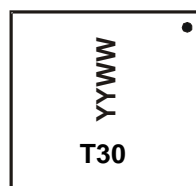
Ordering Information (Note 4)

Part Number	Case	Packaging
DMT3009LDT-7	V-DFN3030-8	3,000/Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information

V-DFN3030-8



T30= Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 15 = 2015)
 WW = Week Code (01 to 53)

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic			Symbol	Q1&Q2	Unit
Drain-Source Voltage			V _{DSS}	30	V
Gate-Source Voltage			V _{GSS}	+20,-16	V
Continuous Drain Current (Note 6) V _{GS} = 10V	Steady State (Note 10)	T _C = +25°C T _C = +70°C	I _D	30 25	A
	t < 10s	T _A = +25°C T _A = +70°C	I _D	14 11	A
Maximum Body Diode Forward Current (Note 6)			I _S	2.1	A
Pulsed Drain Current (100µs Pulse, Duty Cycle = 1%)			I _{DM}	100	A
Avalanche Current (Note 7) L = 0.1mH			I _{AS}	19.3	A
Avalanche Energy (Note 7) L = 0.1mH			E _{AS}	18.6	mJ

Thermal Characteristics

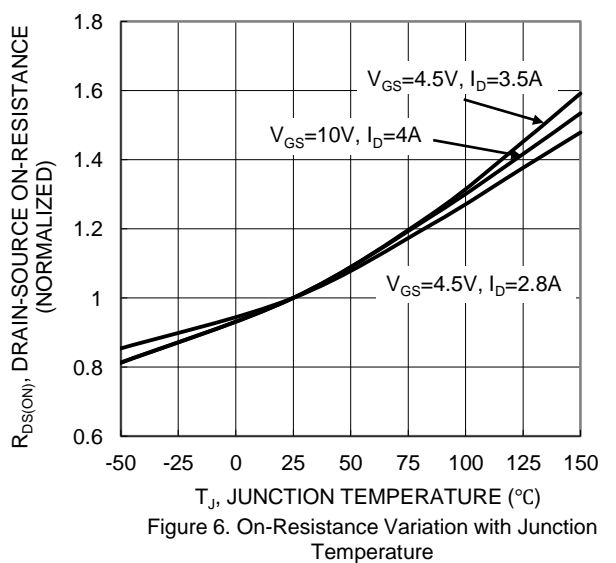
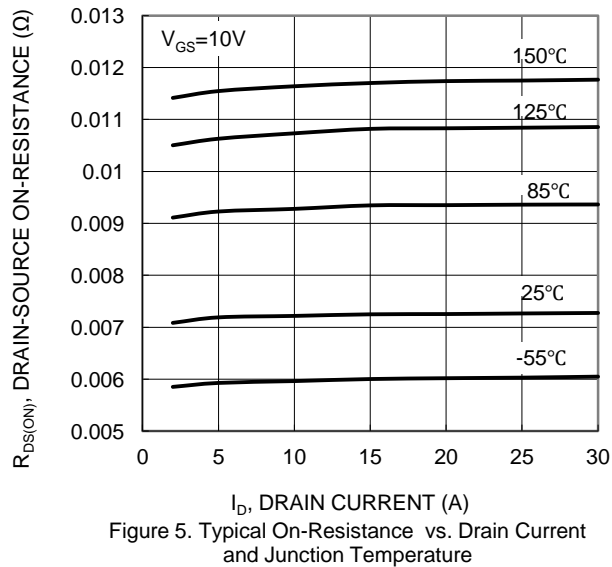
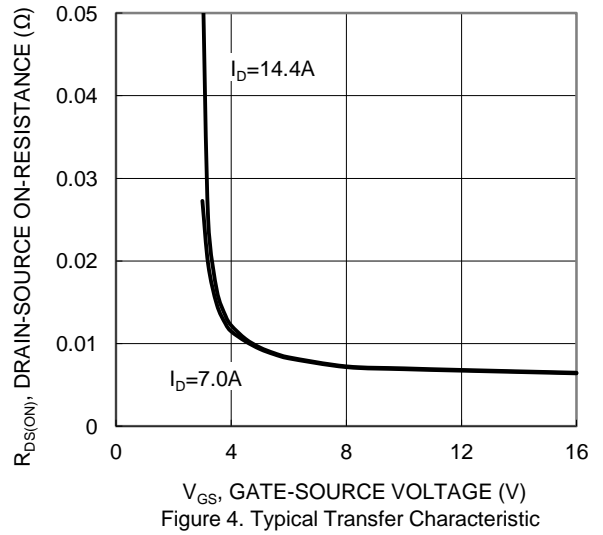
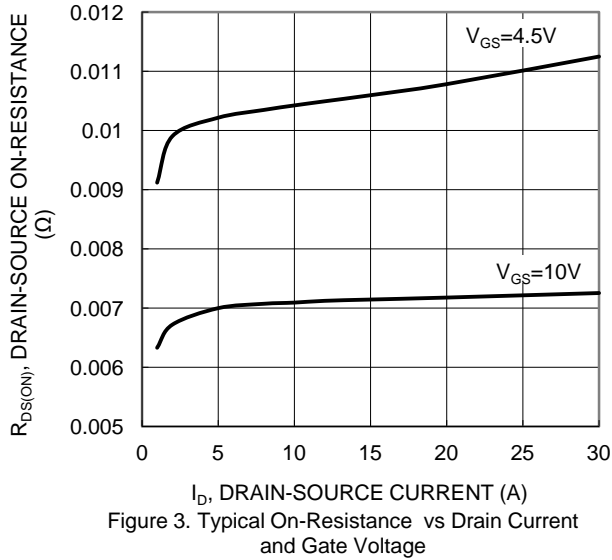
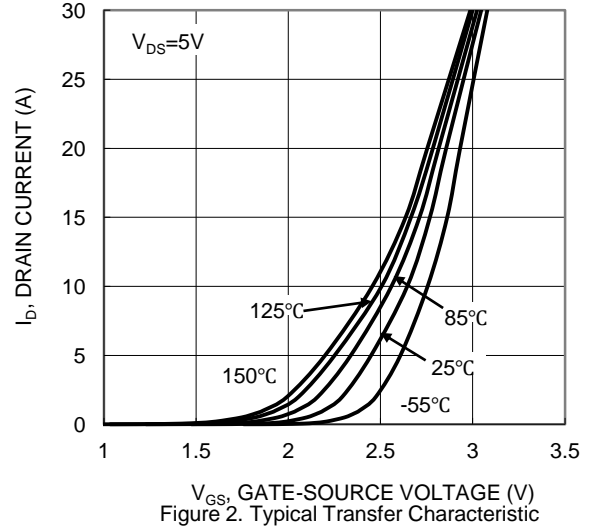
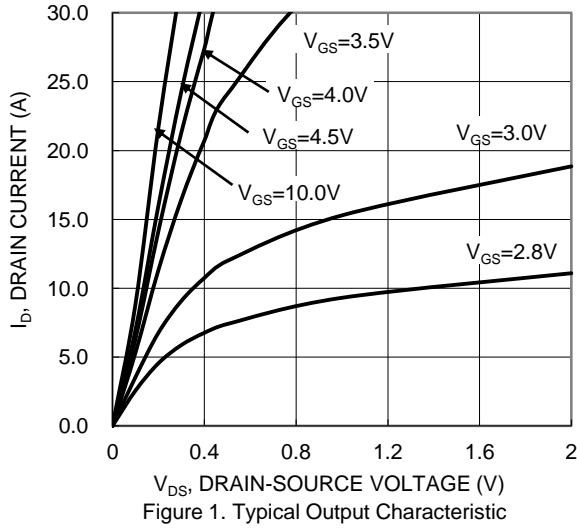
Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T _A = +25°C	P _D	1.2	W
	T _A = +70°C		0.8	
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	R _{θJA}	107	°C/W
	t < 10s		63	
Total Power Dissipation (Note 6)	T _A = +25°C	P _D	2.0	W
	T _A = +70°C		1.2	
Thermal Resistance, Junction to Ambient (Note 6)	Steady state	R _{θJA}	64	°C/W
	t < 10s		39	
Thermal Resistance, Junction to Case (Note 6)		R _{θJC}	7.6	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

- Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate.
7. UIS in production with L = 0.1mH, starting T_A = +25°C.

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV _{DSS}	30	—	—	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	μA	V _{DS} = 24V, V _{GS} = 0V
Zero Gate Voltage Drain Current T _J = +150°C (Note 9)	I _{DSS}	—	—	100	μA	V _{DS} = 24V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = 20V, V _{DS} = 0V V _{GS} = -16V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	1	—	3	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	7.2	11.1	mΩ	V _{GS} = 10V, I _D = 14.4A
		—	10.5	13.8		V _{GS} = 4.5V, I _D = 7A
		—	13	22.0		V _{GS} = 3.8V, I _D = 5A
Diode Forward Voltage	V _{SD}	—	—	1.2	V	V _{GS} = 0V, I _S = 10A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iSS}	—	748	1,500	pF	V _{DS} = 15V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	447	895		
Reverse Transfer Capacitance	C _{rSS}	—	43	90		
Gate Resistance	R _G	—	1.0	2.0	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
Total Gate Charge (V _{GS} = 10V)	Q _g	—	13.8	20	nC	V _{DS} = 15V, I _D = 14.4A
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	6.4	9		
Gate-Source Charge	Q _{gs}	—	2.2	5		
Gate-Drain Charge	Q _{gd}	—	2.2	5		
Turn-On Delay Time	t _{D(ON)}	—	3.5	7	nS	V _{GS} = 10V, V _{DD} = 15V, R _G = 1Ω, I _D = 10A
Turn-On Rise Time	t _R	—	5.0	10		
Turn-Off Delay Time	t _{D(OFF)}	—	8.6	17		
Turn-Off Fall Time	t _F	—	1.4	3		
Body Diode Reverse Recovery Time	t _{RR}	—	18	33	nS	I _F = 10A, di/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q _{RR}	—	7.7	15	nC	I _F = 10A, di/dt = 100A/μs

Notes: 8. Short duration pulse test used to minimize self-heating effect.
9. Guaranteed by design. Not subject to product testing.
10. Package limited.



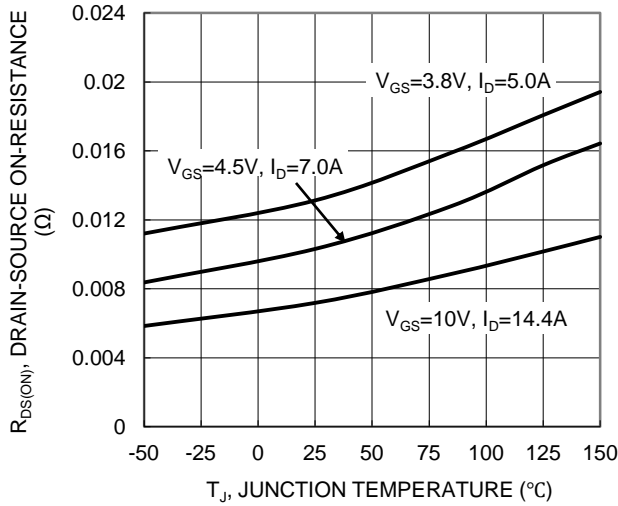


Figure 7. On-Resistance Variation with Junction Temperature

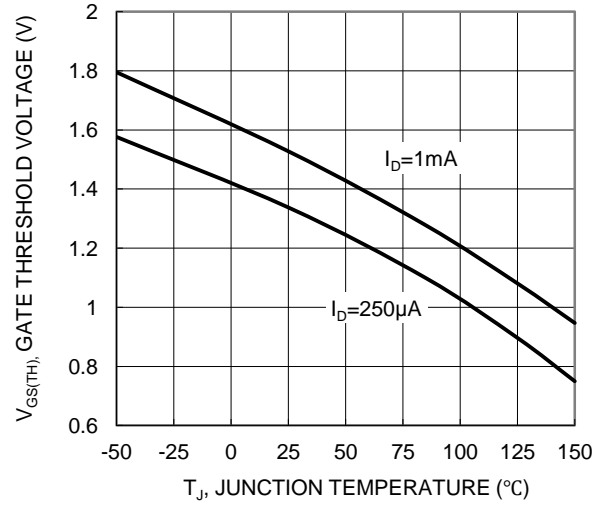


Figure 8. Gate Threshold Variation vs. Junction Temperature

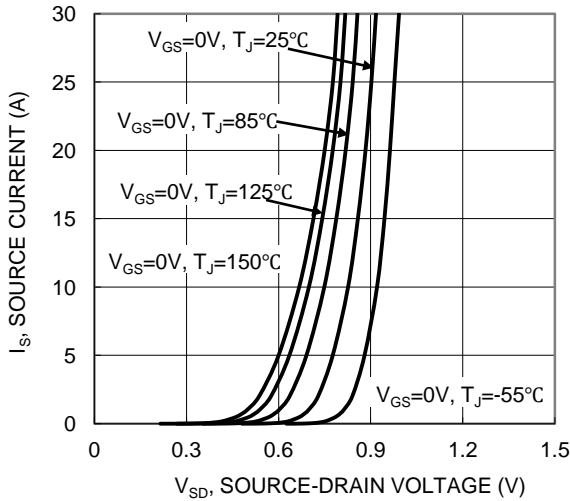


Figure 9. Diode Forward Voltage vs. Current

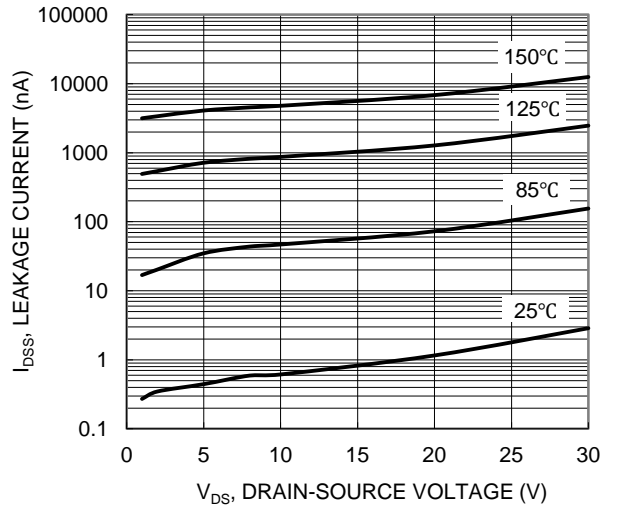


Figure 10. Typical Drain-Source Leakage Current vs. Voltage

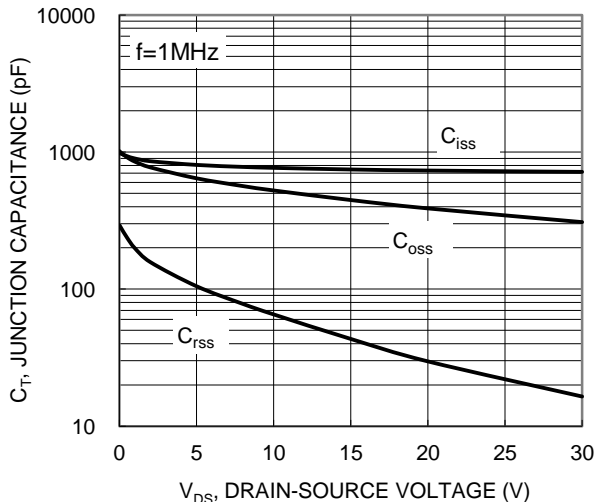


Figure 11. Typical Junction Capacitance

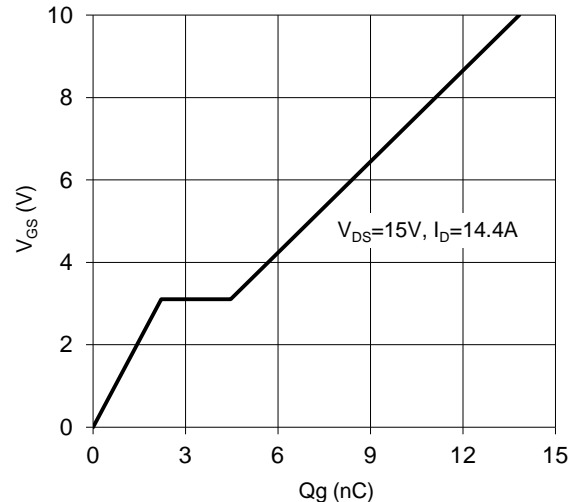


Figure 12. Gate Charge

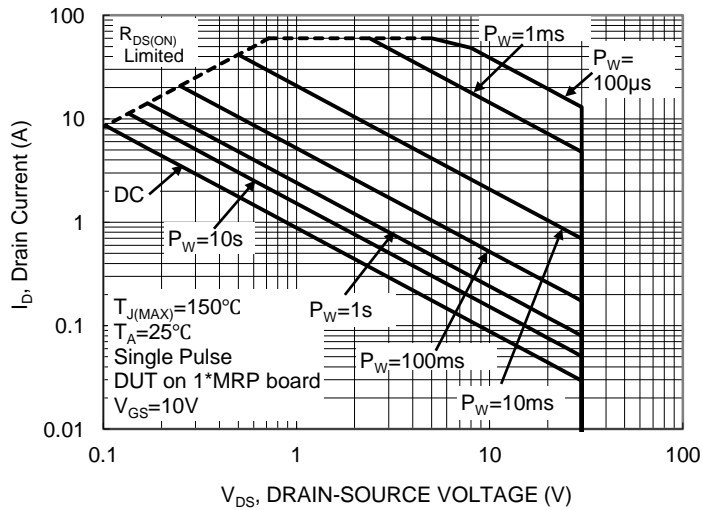


Figure 13. SOA, Safe Operation Area

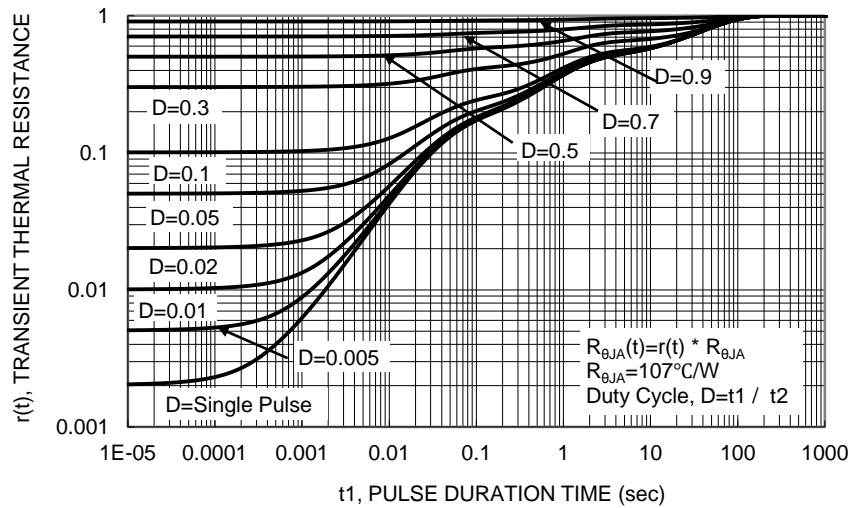
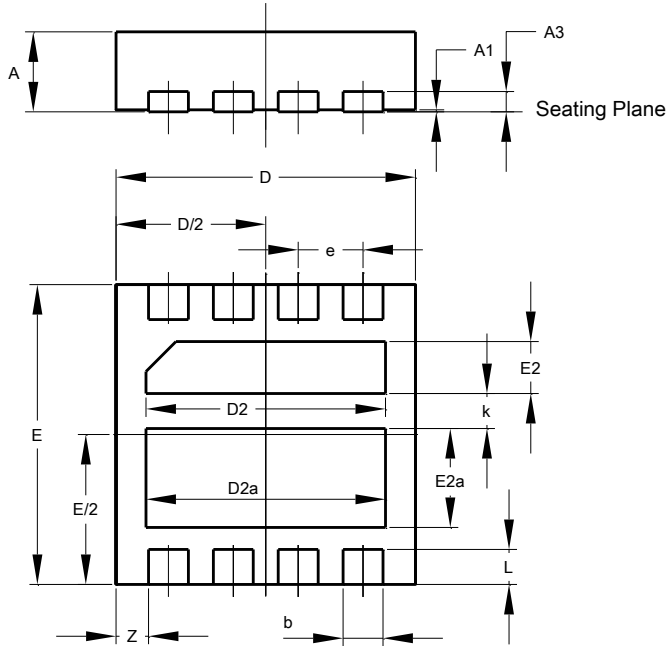


Figure 14. Transient Thermal Resistance

Package Outline Dimensions

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.

V-DFN3030-8 (Type K)

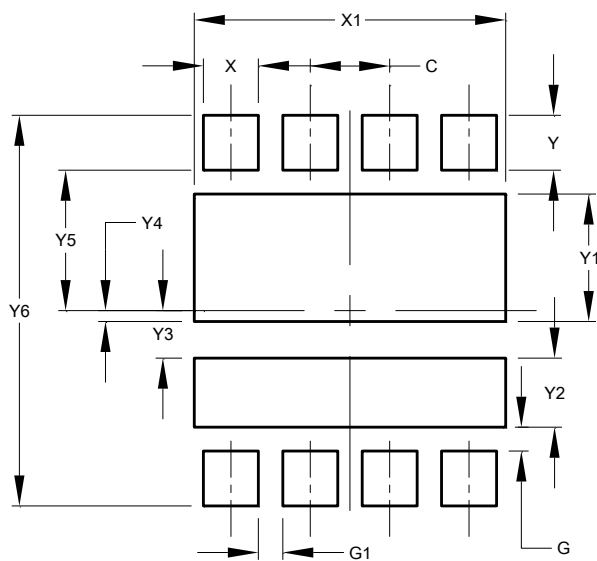


V-DFN3030-8 (Type K)			
Dim	Min	Max	Typ
A	0.77	0.83	0.80
A1	0	0.05	0.02
A3	0.20BSC		
b	0.35	0.45	0.40
D	2.95	3.050	3.00
D2	2.30	2.50	2.40
D2a	2.30	2.50	2.40
E	2.95	3.050	3.00
E2	0.42	0.62	0.52
E2a	0.89	0.109	0.99
e	0.65BSC		
k	-	-	0.35
L	0.30	0.40	0.35
z	0.325BSC		
All Dimensions in mm			

Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.

V-DFN3030-8 (Type K)



Dimensions	Value (in mm)
C	0.650
G	0.195
G1	0.200
X	0.450
X1	2.550
Y	0.450
Y1	1.044
Y2	0.566
Y3	0.389
Y4	0.089
Y5	1.150
Y6	3.200

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